

REMARKS

This amendment is in response to the Office Action mailed September 8, 2008. Claims 1, 2, 13, 15, 16, 25, 27-29, and 34 are amended and claims 3 and 11 are cancelled. Claims 1, 2, 4-10, and 12-34 are currently pending. No new matter has been added.

Objections

Claims 1-15, and 25-34 were objected to because of the following informalities. Claim 1 was objected to as unclear where the preamble ends and the body of the claim begins. The Applicants respectfully submit that the preamble ends at the term "comprising." Claim 1 is written in a well-established form that is used for many claims.

Claim 1 was also objected to because the terms "the lumen" and "the catheter" allegedly lack antecedent basis. The Applicants respectfully submit that the antecedent basis for these terms is found in the preamble of claim 1.

Claim 2 was objected to as allegedly unclear regarding whether the term "is" is inclusive or exclusive as the term "formed into a coil shape" seems to be directed to a method of making the device rather than the device itself. The Applicants have amended claim 2 to recite that the sensor is a conductive wire with a coil shape.

Claims 9 and 26 were rejected as allegedly unclear regarding what additional structural limitation has been set forth. Claims 9 and 26 both recite that the sensor/sensor coil is adapted to communicate with a medical positioning system. Accordingly, these claims require that the sensor/sensor coil have a structure that permits communication with a medical positioning system.

The objection to claim 11 is moot because claim 11 has been canceled.

Claims 15 and 34 were objected to because allegedly the claims appear to be directed to the use of the device alone. The Applicants have amended the claims to recite that the imaging device is in parallel with the sensor (i.e., the imaging device and sensor are parallel in an electrical sense.)

Claim 25 was objected to because allegedly “the lumen of the sheath” lacks antecedent basis. Claim 25 has been amended to provide antecedent basis for “lumen” and “sheath”.

Claim 27 has been amended to recite “an imaging catheter ... including ... an imaging device” instead of the two separate recitations of “an imaging device”.

Claims 28 and 29 have been amended to remove the term “of”.

The Applicants respectfully request withdrawal of the objections to the claims.

Double Patenting

Claims 1-27, 29-34 were rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 7,081,094 to Ostrovsky (“Ostrovsky”). Claim 28 was rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-15 of Ostrovsky in view of U.S. Patent No. 4,917,097 to Proudian et al. (“Proudian”). The Applicants traverse these rejections.

Claim 1 recites a sensor coupled to the imaging device within the lumen and positioned proximal to an imaging device; and one or more traces formed over the sensor and configured to electrically couple the imaging device to an energy source. Claim 16 recites a sensor coil; a non-conductive layer of epoxy surrounding the sensor coil; an imaging device, having first and second terminals, disposed distal to the sensor coil; and first and second traces residing in the non-conductive layer of epoxy. Claim 27 recites a sensor located proximal to an imaging device; a non-conductive material surrounding the sensor; and one or more conductive traces formed within the non-conductive material. None of the cited references, alone or in combination, teach or suggest these elements of claims 1, 16, and 27.

Ostrovsky does not teach or suggest the recited traces that are formed over the sensor or disposed in a non-conductive material or layer surrounding the sensor or sensor coil, as recited in claims 1, 16, and 27. In Ostrovsky, a coaxial cable 410 passes through the center of the sensor 320 for coupling the distally located transducer 370/380/390 to an energy source. There is no teaching

or suggestion in Ostrovsky of conductive traces disposed over the sensor for connection to the imaging device because in Ostrovsky the coaxial cable, containing conductors, passes through the sensor. In the Ostrovsky arrangement, a solid core for the sensor can not be provided because the coaxial cable must pass. In the present claimed subject matter, a solid core for the sensor is available because the traces pass over the sensor to connect with the imaging device. Ostrovsky does not teach or suggest such an arrangement or the advantages of such an arrangement. Accordingly, claims 1, 16, and 27 are not obvious in view of claims 1-15 of Ostrovsky.

None of the other cited references address these deficiencies of Ostrovsky. For at least these reasons, claims 1, 16, and 27, as well as the remainder of the claims which depend therefrom, are patentable over the cited references. The Applicants respectfully request withdrawal of the rejections of these claims.

§102 and §103 Rejections

Claims 1-6, 9-12, 27, 30, 32, and 33 were rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. 6,248,074 to Ohno et al. ("Ohno"). Claims 7, 8, 13-25, 26, 29, 31, and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ohno in view of U.S. Patent No. 5,947,905 to Hadjicostis et al. ("Hadjicostis"). Claim 28 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ohno in view of Proudian. The Applicants traverse these rejections.

Claim 1 recites a sensor coupled to the imaging device within the lumen and positioned proximal to an imaging device; and one or more traces formed over the sensor. Claim 16 recites a sensor coil; a non-conductive layer of epoxy surrounding the sensor coil; an imaging device, having first and second terminals, disposed distal to the sensor coil; and first and second traces residing in the non-conductive layer of epoxy. Claim 27 recites a sensor located proximal to an imaging device; a non-conductive material surrounding the sensor; and one or more conductive traces formed within the non-conductive material. None of the cited references, alone or in combination, teach or suggest these elements of claims 1, 16, and 27.

In Ohno, the magnetic sensor is positioned distal to the ultrasonic transducer (see e.g., Figure 3 of Ohno.) In contrast, claims 1, 16, and 27 each recite that the imaging device is distal to the sensor or sensor coil.

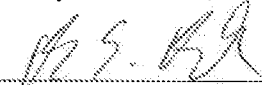
Moreover, Ohno does not teach or suggest the recited traces that are formed over the sensor or disposed in a non-conductive material or layer surrounding the sensor or sensor coil, as recited in claims 1, 16, and 27. There is no need for such traces in Ohno because the sensor is distal to the ultrasonic transducer. The recited traces are used in the present application to couple the distally-located imaging device to an energy source and, therefore, must traverse the sensor which is between the imaging device and the energy source.

None of the other cited references address these deficiencies of Ohno. For at least these reasons, claims 1, 16, and 27, as well as the remainder of the claims which depend therefrom, are patentable over the cited references. The Applicants respectfully request withdrawal of the rejections of these claims.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue. If the Examiner has any questions or concerns, the Applicants encourage the Examiner to contact the Applicants' representative, Bruce Black, by telephone to discuss the matter.

Dated: November 19, 2008

Respectfully submitted,

By 

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